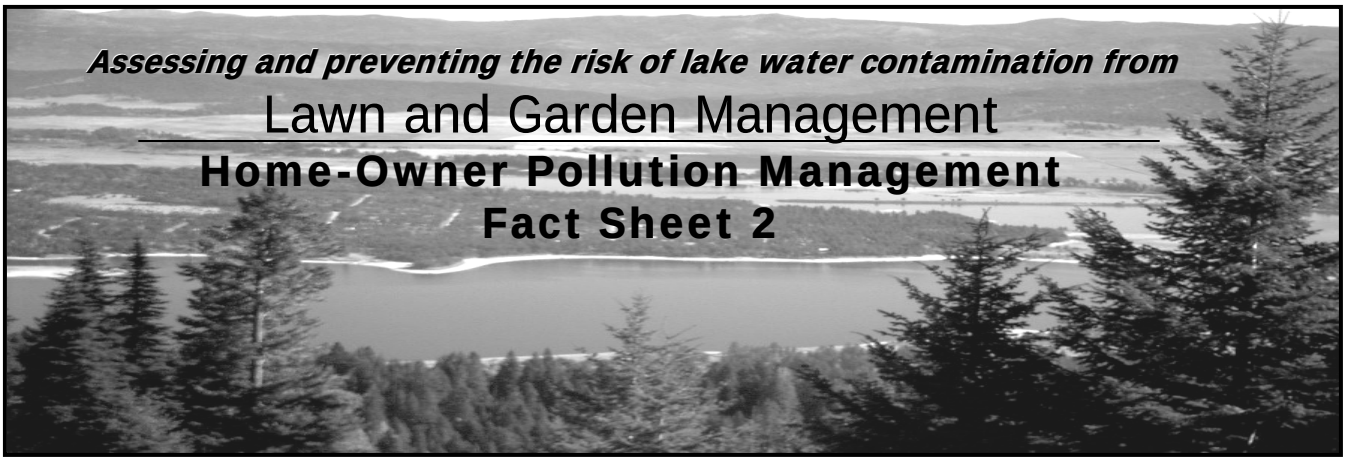


Why are Lawns and Gardens a Potential Problem?

Homeowners commonly over-apply fertilizer, adding much more nitrogen and phosphorus to a lawn than it will use. Over-watering can cause excess nutrients or pesticides to be either washed into the lake, or leach into the lake through shallow ground water.

Lawns and gardens near Lake Cascade or any of its tributaries must be carefully planned and maintained to prevent possible contamination of surface waters. Native vegetation should be considered as a quality alternative to cultured lawns and landscapes. Landscapes will revert to a native state if no maintenance is performed; planting native vegetation will hasten the process.

Water Quality Concerns

- **Fertilizers–** Supply excess nutrients, especially nitrates and phosphorus, increasing aquatic plant and algae growth which can lead to reduced dissolved oxygen in bottom lake waters.
- **Pesticides–** Kill beneficial plants and insects resulting in lowered fish productivity and contaminated spawning beds. Cause chronic health problems in humans.
- **Irrigation–** Too much pushes fertilizers and pesticides into ground water, and/or, along with sediment, runoff into surface water.

Improving Lawn and Garden Management

Before beginning any practice, stop and think about potential risks to water quality. Homeowners must be aware of potential problems caused by soil erosion, as well as pollution due to chemical amendments and organic yard waste.

Special attention should be paid if the following conditions exist:

- There are areas of exposed soil—flowerbeds, vegetable gardens, or poorly established vegetation.
- Soils with a coarse texture, such as sands or sandy loams which are common along Lake Cascade.
- The property slopes toward surface water.
- There are impervious surfaces, such as sidewalks and driveways.
- Lawn or landscape maintenance is being done close to the surface water.
- Fertilizers, pesticides, or soil amendments are being applied.
- Avoid or minimize the use of chemical fertilizers and pesticides.

Why should homeowners be concerned about pesticide use on their lawns and gardens?

Pesticide over use or misapplication may cause the following:

- Harm or kill beneficial insects and earthworms associated with your lawn or garden;
- Harm to humans, wildlife, and pets that come into contact with your lawn or garden;
- Result in chemical runoff, during rainfall or irrigation; damaging the aquatic ecosystem fish rely on;
- Leach through the soil directly into ground water which is used for drinking water;
- Accumulate in the soil and become toxic to the plants you are growing; and
- Create pest resistance to the applied chemicals so that they will be very difficult to control in the future.

Why should homeowners be concerned about fertilizer use on lawns and gardens?

- Nitrates and phosphorus, the two main ingredients in most fertilizers, can contaminate surface water;
- Nitrates from fertilizers can contaminate drinking water supplies by leaching into ground water fed wells, which at 10 parts per million is especially hazardous to pregnant women, and fatal to infants under 6 months of age, and can also be fatal to young ruminant animals.
- Cause diseases, such as necrotic ring spot in lawns.
- Make some weeds more competitive with the plants you are trying to grow.
- Causes excess aquatic weed growth.

BMPs for Protecting Surface Waters

The most efficient BMP for protecting surface water from lawn and garden activities is to add or enhance a **vegetative filter strip** (see figure 1) between the lake and your lawncare maintenance practices. This alone will help preserve water quality by filtering rain and irrigation runoff, and by absorbing nutrients from shallow ground water. Other BMPs include:

- Rake dead leaves and brush away from the water; compost vegetation in a sturdy structure away from the shoreline.
- Never dump leaves and vegetative debris into the lake or a stream because this releases nutrients and organic acids into the water and uses up valuable oxygen needed by fish.
- Avoid burning on the beach or near shore because the remaining ash is highly alkaline and may change the pH of the lake and promote growth of undesirable plants.
- When treating diseases or insect pests, use chemicals responsibly and use only the required amount. **Note: Use of pesticides, insecticides or fertilizers within 15 feet of the high water line of Lake Cascade is not encouraged.**

Preventing Soil Erosion

Surface waters can be contaminated by soil particles that are washed or blown into the water. In addition to the problem of sediment, soil particles can carry phosphorus, which is a harmful pollutant, into the water.

To avoid this problem (see figure 1):

- maintain a vigorously growing filter zone of grass, trees, and shrubs next to surface waters;
- minimize areas of exposed soil by maintaining native vegetation or dense turf;
- construct an earth berm near the shore to minimize the possibility of runoff; the berm, which is a small mound of earth, should run parallel to the shore to prevent runoff into surface water.

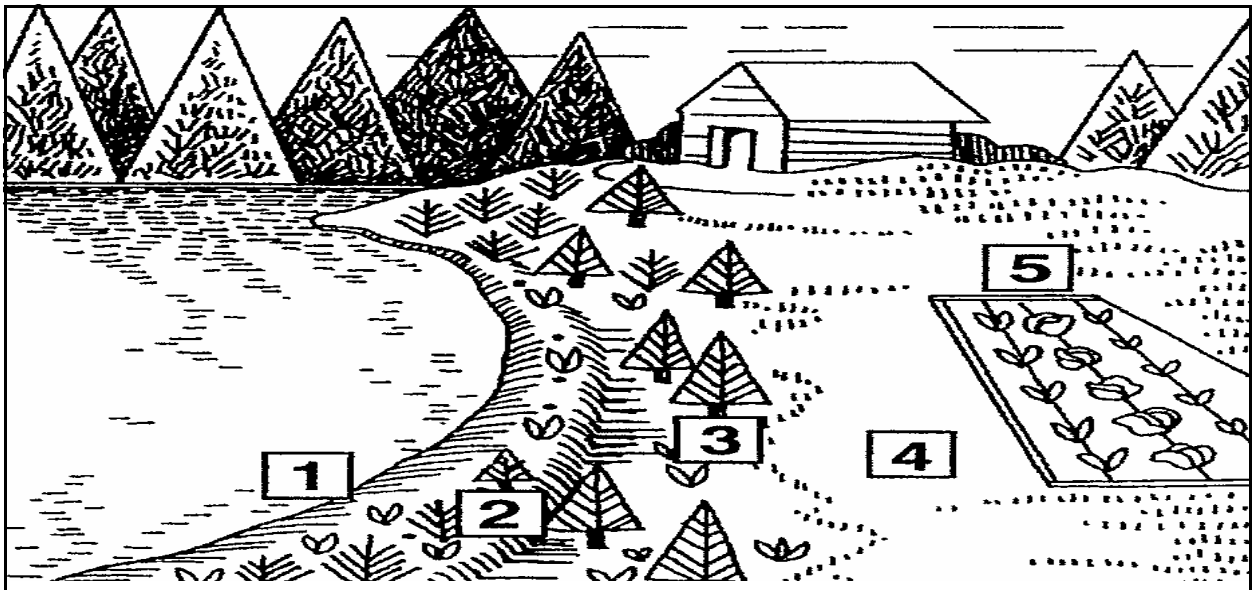


Figure 1*: A well designed landscape plan includes ① natural vegetation along the water's edge; ② an intact ridge or added berm; ③ a natural vegetation filter strip; ④ well-established grass or ground cover; ⑤ a level flower or vegetable garden set back from the water front.*

Best Management Practices for Lawns

A healthy good-looking lawn actually improves your living environment. On a hot day, your lawn reduces the glare of the sun, keeps surrounding areas cooler, and will attract birds and other wildlife. On windy and rainy days, your lawn protects the soil on your property from erosion. But lawns and gardens near surface waters must be carefully planned and maintained to prevent possible contamination of surface waters. Native vegetation should be considered as a quality alternative to cultured lawns and landscapes. Landscapes will revert to a native state if no maintenance is preformed; planting native vegetation will hasten the process.

Pest Management for Lawns

If possible, avoid the use of chemical pesticides. Consult a professional applicator or an Extension Agent from the University of Idaho Extension Service (382-7190) when making a decision. The following practices will minimize the potential contamination from pesticides:

- Properly identify whether the pest is an insect, disease, or other problem;
- Determine if there is an economic or aesthetic justification for initiating control of the pest;
- Consider control options other than the use of a chemical pesticide; **biological controls and pest-resistant plant varieties are becoming more available;**
- Use the least toxic and most readily degradable pesticide that will be effective;
- **Read the pesticide label carefully and pay special attention to safety precautions and warnings about use near water**;
- Do not apply pesticides when it is windy to avoid the possibility of drift;
- When purchasing pesticides, buy only what is needed to control the problem during the current season. For empty pesticide containers, **triple rinse** the containers and use the rinse water as part of your yard management;
- Waste pesticides and containers should be disposed of properly. Never pour excess pesticides on the ground, into surface waters, or into sanitary treatment systems; contact Valley County Extension office for the next Idaho State Department of Agriculture pesticide container recycling event.

Fertilizer Management

Native vegetation does not require the application of additional fertilizer. Use caution if applying fertilizers to lawns and adhere to the following guidelines:

- **Have your soil tested to determine how much fertilizer is needed to minimize the use of chemical fertilizers; soil test sample bags are available through the Valley County University of Idaho Extension Service (382-7190) .**

- Use alternative forms of fertilizer. **Grass clippings provide (a years worth) 2 pounds annual nitrogen; Compost provides 1 pound annual nitrogen; and Corn Gluten (20 pounds per 1000 square feet) provides 2 pounds annual nitrogen**. This is preferable to chemical fertilizer. However, natural amendments have the potential to damage water quality if used in excessive amounts.
- If chemical fertilizers are used, select slow-release (water insoluble) forms; see section on Soil Fertility Management for timing.
- Water your lawn after fertilizing, but do not allow excess water to run off into surface waters.
- Sweep up any fertilizer spilled on hard surfaces and reapply to the grass, never wash it off.
- Use extra caution when applying fertilizer near surface waters; do not spread fertilizer within **15 feet of surface waters** or wetlands; use a "drop" spreader and not a "cyclone" spreader to minimize the possibility of getting fertilizer directly into the water.
- Never apply fertilizers to frozen ground or snow.
- Leave a natural filter strip of grass, trees, and/or shrubs next to the shoreline; another option would be to construct a berm along the shore.

Irrigation Management

Use water wisely on lawns. Over-watering may cause pesticides, fertilizers, and sediment to either runoff to surface waters, or leach and contaminate the ground water you use for drinking water.

- Established lawns only need 1" to 2" of water per week.
- Water deeply in the early morning and evening to avoid evaporation.
- Avoid over-watering. Avoid this at all times, but especially after applying fertilizers and pesticides.

- Leave grass clippings on the lawn this will:

  √ shade the soil surface, reducing moisture loss;

  √ provide nitrogen, potassium and phosphorus, reducing the need for fertilizer;

  √ help decompose thatch;

  √ save time and energy by not bagging clippings.

Establishing New Turf

Retaining native vegetation is the recommended best management practice. But if having a lush green lawn is what you want the following practices will help you prevent pollutants from entering Lake Cascade or its tributaries.

- For maximum pollution prevention a 25 foot wide riparian vegetation buffer strip must be maintained between any management activities associated with lawn care and surface waters.
- Natural vegetation cannot be excessively removed from the riparian zone, generally a distance of 50 to 100 feet from the surface water is recommended. Removal of vegetation from slopes should be minimal. Do not remove more than 25% of vegetation.

- **If there is a bare slope and the danger of soil erosion exists add a layer of mulch to stabilize it then sod for best results.**
- Seeding is effective if runoff is not a problem and if the seedbed can be kept moist. Bluegrass seed requires three weeks to establish, and if the seedbed dries out during this time, the seedlings may die.
- When seeding, preparation of a good seedbed is necessary for success. Seed-soil contact is essential. Select seed varieties that are suitable for full sun or partial shade. An excellent mixture for around Lake Cascade is Bluegrass, Creeping Red Fescue, and Perennial Rye.

MAINTAINING ESTABLISHED TURF

Soil Fertility Management

Adequate soil nitrogen is necessary for a healthy lawn. Many property owners use nitrogen fertilizer to enhance the nitrogen levels in their soil. In most cases, adding nitrogen fertilizer produces greener, thicker, faster-growing lawns and garden plants. **Nitrogen is a very mobile nutrient and attention must be paid to application rates and timing to eliminate the possibility of water contamination.**

- Do not apply more than 3 lb. of actual nitrogen per 1,000 square feet of lawn per year. If soils are sandy or grass is sparse, you will want to test your soil for best results.
- For best results split apply your fertilizer by dividing your total need by 4. Then apply once on Memorial Day, once on the Fourth of July, once on Labor day, and then again in October.
- The use of slow-release nitrogen is desirable. This may be some form of organic fertilizer or "synthetic" slow-release form.
- Never apply fertilizer to frozen ground or on snow.

- Use extreme caution when applying fertilizers near water. **Fertilizer application is not encouraged within 15 feet of Lake Cascade and its tributaries .** Never allow any fertilizer to enter surface water or wetlands.

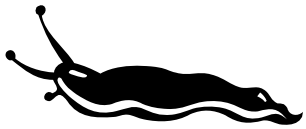
With proper management, dense turf provides a good ground cover to prevent soil erosion.

Best Management Practices for Gardens

Pest Management for Gardens

It is best to avoid using pesticides as both beneficial insects (ladybugs) and pests (weeds, insects, and disease) may be killed. The following pest management BMPs will help keep your garden ecosystem healthy.

- Create a garden with diversity. Plant a combination of different types of plants to create a balanced ecosystem and in general, rotate plants each year to outsmart potential pests and minimize the threat of soil borne diseases.
- Maximize conditions for healthy plant growth. Choose plants that are suited for your climate and are resistant to diseases in the area. Group plants according to water and light requirements and space them to allow ample root and top growth at maturity.
- Protect and use beneficial insects. Develop garden habitats to ensure a healthy environment for beneficial insects. Also, learn to recognize the eggs and larvae of beneficial insects so as to not harm them.
- Use the least toxic solution for your problems. Some low toxic methods to solve problems include biological controls, insect traps, or mechanical means to remove pests. Also, learn to live with a low level of plant damage.



- If you do use herbicides or pesticides, use them carefully. Identify the insect and weed pests and select the appropriate chemical. Also, buy only what you need and be sure to follow label directions.

- Use the least toxic solution for your problems. Some low toxic methods to solve problems include biological controls, insect traps, or mechanical means to remove pests. Also, learn to live with a low level of plant damage.
- If you do use herbicides or pesticides, use them carefully. Identify the insect and weed pests and select the appropriate chemical. Also, buy only what you need and be sure to follow label directions.

- Store and dispose of herbicides and pesticides properly. Store any extra in a secured area, and if you need to dispose of these chemicals, take it to your locally organized household hazardous waste collection program or go through the Idaho State Department of Agriculture Pesticide Disposal Program.

Fertilizer Management for Gardens

Fertilizer should be added only in the amounts needed, at the appropriate time, and in a form that makes the nutrients available to plants. Nutrient management BMPs to implement in your garden includes:

- Test your soil. Test your soil for nitrogen (N), phosphorus (P), potassium (K), sulfur (S), pH, and organic matter. Soil samples should be taken to a depth of 12 inches.
- Build a healthy soil. Add organic matter, such as compost to enhance the structure, aeration, and nutrient and water holding capacity of the soil. Organic matter can also be added by growing cover crops. Also, try to supply needed nutrients using organic fertilizers, such as composted manure, cottonseed meal, bone meal, blood meal, and greensand. Most gardening shops have these types of fertilizers. If not, you can order from gardening retailers that specialize in providing organic fertilizers and pesticides.
- Apply fertilizers properly. Based on your soil test and plant needs, apply the proper rate of nutrients and apply it at the correct growth stage of the plant. Overfeeding plants can be as detrimental as underfeeding, but this risk can be reduced if organic fertilizers are used, because the nutrients are released slowly. Synthetic fertilizers are also useful, as they can provide readily needed nutrients. Be sure not to over apply.

Irrigation water management for gardens

- Reduce the need for watering by mulching. Mulches not only slow the evaporation of water from the soil surface but also can improve a soil's water holding capacity, keep the soil cooler on hot summer days, reduce weed growth, and help prevent soil erosion. Examples of organic mulches include grass clippings, leaves, and straw. Inorganic mulches may also be used and examples are permeable sheeting and/or rock. Keep in mind that rocks can form undesirable heat sinks.

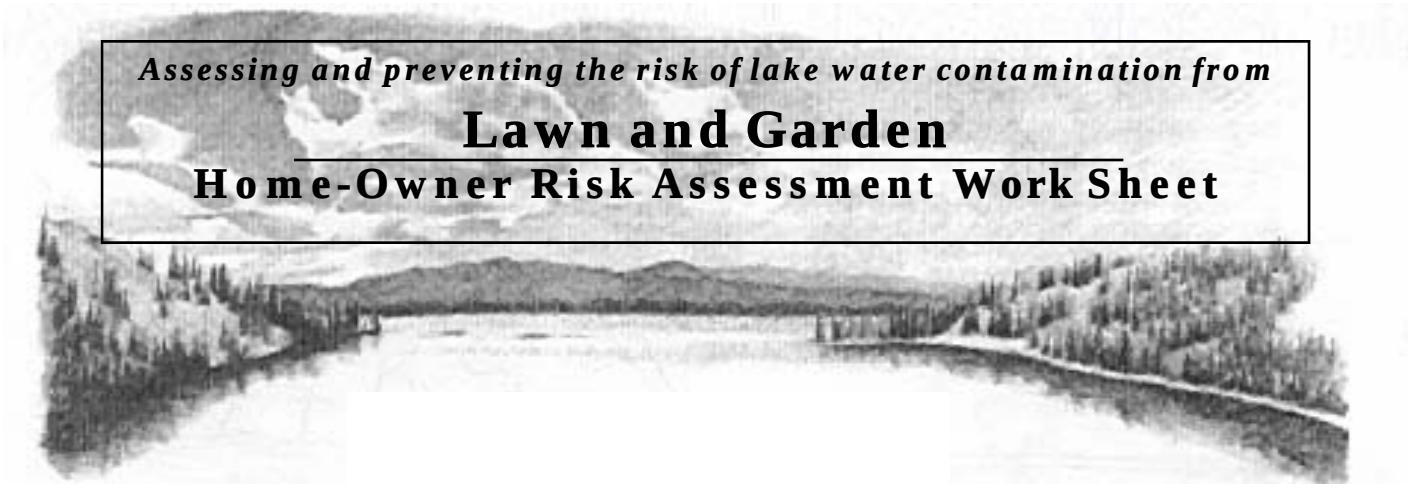
Irrigation Water Management for Gardens

- Reduce the need for watering by improving soil structure. Each year be sure to add organic matter such as compost, grass clippings, tilled in cover crops, and other dead plant materials.
- Irrigate only when the plants need water. Check whether the soil is dry several inches below the surface. If it is dry, then water, but water slow enough so that it soaks into the root zone and does not run off the soil surface. The depth of the root zone depends on the plant, but in general this is 6 to 8 inches deep. If possible, use a drip irrigation system to conserve water.

Location of Gardens

Flower and vegetable gardens can add to the quality of life of property owners living around Lake Cascade. Certain precautions must be taken to prevent the possibility of surface water contamination.

- Gardens should **not** be located on slopes because they can promote accelerated soil erosion and runoff. An alternative on slopes is to install a terraced garden. Dense turf or other vegetation should be established on slopes.
- To minimize the area of exposed soil, use intensive growing techniques such as intercropping, succession planting, and raised beds.



Assessing and preventing the risk of lake water contamination from

Lawn and Garden

Home-Owner Risk Assessment Work Sheet

ASSESSMENT 1 – *Lawn and Garden* – The assessment table below will help you identify potential environmental risks related to Lake Cascade and your lawn and garden maintenance practices. For each question indicate your risk level in the right-hand column. Some choices may not correspond exactly to your situation. Choose the response that best fits. When finished turn to the **Action Checklist** and record your medium and high-risk practices. Your goal is to lower your risks. Use the BMP recommendations to help you decide how to best reduce pollution.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Fertilizers:	Soil is tested for nutrients. Fertilizer rate is used at label recommendations and applied more than 100 ft from any surface water source.	Soil is not tested. Fertilizer is used at an unknown rate, 50 to 100 feet from any surface water.	Soil is not tested. Fertilizer is applied at a higher rate than label recommendation. Fertilizer is applied 10-50 feet from the lake or its tributaries.	❒ Low ❒ Medium ❒ High
Pesticides:	Do not use chemicals to control weeds, insects, or diseases. Encourage natural defenses (lady bugs and wasps). Use non-toxic solutions (Pull weeds).	Limited use of chemicals, spot spray mostly.	Rely on chemical control for control of pests.	❒ Low ❒ Medium ❒ High
Storage of pesticides, fertilizers, and other chemicals:	Chemicals are stored in waterproof containers in a secure area protected from stormwater and over 100 feet away from the lake or its tributaries.	Chemicals are stored in waterproof containers but not in a secured area.	Chemicals are stored in non-waterproof containers outdoors or within reach of stormwater or in a well-house.	❒ Low ❒ Medium ❒ High
Handling and disposal of pesticides, fertilizers, and other chemicals:	Any spills are cleaned up immediately. Disposal through a local household hazardous waste collection event or approved landfill.		Spills are not cleaned up. Disposal of chemicals consists of burning, or dumping at an unapproved landfill or on the property.	❒ Low ❒ Medium ❒ High

ASSESSMENT 1 CONTINUED– *Lawn and Garden Care*. When finished turn to the **Action Checklist** and record your medium and high-risk practices. Use the BMP recommendations to help you decide how to best reduce pollution.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Grass clippings, leaves, and other yard waste:	Grass clippings, leaves and other yard wastes are swept off paved surfaces and onto lawns away from water flow routes. Leaves and other wastes are composted.		Leaves and other yard wastes are raked into piles near the lake and burned on-site.	❒ Low ❒ Medium ❒ High
Bare soil, gardens, & landscaping projects: **Proximity to surface water:**	Areas of bare soil are seeded and topped with a layer of mulch or straw. Sediment retention barriers (straw bales, silt fence) are used especially on steeper slopes until grass is established. >500 feet to surface water.	Soil is left bare during a construction project, but natural features slow and treat most runoff. 300-500 feet to surface water.	Soil is left bare and no natural features or sediment retention barriers are used. 10-300 feet to surface water.	❒ Low ❒ Medium ❒ High ❒ Low ❒ Medium ❒ High
Lawn type and maintenance	Turf-grass is suited to soil type, available sunlight, and climate. Grass is pest resistant and mowed high (a mixture of blue-grass,fescue, and brome is recommended).	Turf-grass is suited to the site, and is mowed shorter than second highest setting on mower.	Grass type is not suited to available light, soil type, or climate. Grass is mowed as short as possible and growth is encouraged right up to shoreline.	❒ Low ❒ Medium ❒ High
Irrigation Management:	Application of water based on the requirement of plants. Watering is done in the morning or evening. Plants are suitable to climate and do not need extra water.	Watering is excessive.	Heavy application of water. There is excessive water runoff. Time of watering is not adjusted according to pesticide and fertilizer applications.	❒ Low ❒ Medium ❒ High
Composting	The compost pile is well-maintained: It is aerated regularly and contains yard waste, vegetable food scraps, and other nitrogen sources (manure).	The compost pile is poorly maintained: It is not aerated or lacks the proper mix of materials. Pet wastes are added to the pile. Is located within 50-100 feet of surface waters.	The compost pile is poorly maintained: It contains excessive high-nitrogen material and is not turned regularly. The pile is less than 50 feet from the lake or a tributary.	❒ Low ❒ Medium ❒ High

ASSESSMENT 2 – *Location of Application in Relation to Water Resources*. When finished turn to the **Action Checklist** and record your medium and high-risk practices. Use the BMP recommendations to help you decide how to best reduce pollution.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Location of fertilizer application in relation to surface waters:	Fertilizer is applied at the recommended rate more than 50 feet away from surface waters and surface runoff from post application watering does not drain into surface waters.		Fertilizer is applied 10 to 50 feet from the lake or its tributaries and the drainage of post application watering is not considered.	❒ Low ❒ Medium ❒ High
Location of well in relation to application area:	Application area is down gradient and over 25 ft from the well. No post application surface water reaches well area.	Application area is up gradient and over 25 feet from the well. Post application water drainage does not reach the wellhead.	Application is applied to the lawn area around the well. Post application surface water moves across wellhead area.	❒ Low ❒ Medium ❒ High
Solubility of fertilizer: (ability to dissolve in water)	Low solubility. 2-3lbs of a non-synthetic fertilizer is split applied (4x/ year). Or, use organic fertilizer or mulch.	Moderately-high solubility. Synthetic fertilizer used. Applied at full rate each time.	High solubility. Applied at full rate 3-4x/ year.	❒ Low ❒ Medium ❒ High
Amount of fertilizer applied:	Application rate is based on soil tests. Recommended amount is measured out when applied.		No soil tests. Fertilizer is applied at an unknown rate.	❒ Low ❒ Medium ❒ High
Location of Pesticide application in relation to Lake Cascade and streams:	No pesticides are applied. Or spot application is used to control noxious weeds more than 10 feet away from surface water.	Weed and feed is used on the lawn, but more than 10 feet away from surface waters.	Pesticides are used within 10 feet of the lake.	❒ Low ❒ Medium ❒ High
Relative leachability of pesticide: **(**ability to move to the ground water)	Low	Medium	High	❒ Low ❒ Medium ❒ High
Vegetation Buffer:	Shrubs, ground cover, and trees are planted between the lake and the lawn and garden to reduce soil erosion and uptake excess nutrients and pesticides.	A natural buffer is present along the shoreline, but the lawn is manicured as close as possible to the lake.	No natural or planted vegetation buffer is present between the lake and the lawn and garden.	❒ Low ❒ Medium ❒ High

ACTION CHECKLIST

Lawn and Garden Management

Write all high and medium risks below.	**What can you do to reduce the risks?**	**Set a target date for action.**
Sample: Fertilizers applied without regard to soil test.	Contact Extension Service for information on soil testing to determine application rate.	One week from today: June 1

Information derived from Lake*A*Syst materials is intended only to provide general information and recommendations to property owners around Lake Cascade regarding their management practices. **All results are confidential**.